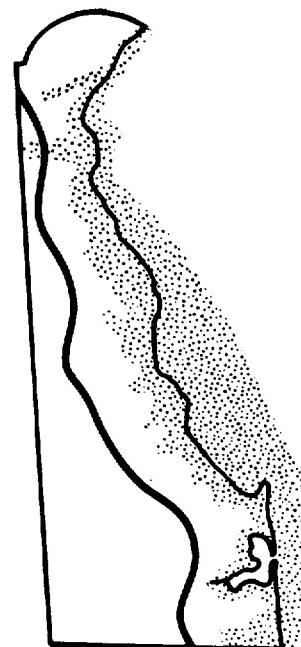


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COASTAL ZONE MANAGEMENT FOR DELAWARE



FEBRUARY 18, 1971

GOVERNOR'S TASK FORCE ON MARINE AND COASTAL AFFAIRS

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COASTAL ZONE MANAGEMENT FOR DELAWARE

February 18, 1971

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GOVERNOR'S TASK FORCE ON
MARINE AND COASTAL AFFAIRS

18 February 1971

The Honorable Russell W. Peterson
Governor of Delaware
Dover, Delaware

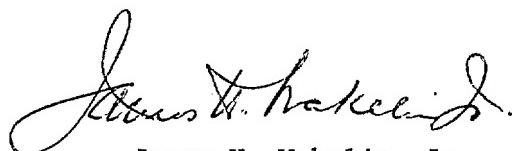
Dear Governor Peterson:

I have the honor to submit to you the Preliminary Report on the Coastal Zone of Delaware prepared by your Task Force on Marine and Coastal Affairs. This report contains key recommendations concerning the future use of Delaware's Coastal Zone.

The Task Force is now in the process of preparing a Final Report on the Coastal Zone of Delaware which will be completed in four to six months. This report will contain detailed information on the present status, trends and problems relating to the resources of the Coastal Zone and will include recommendations additional to those in the Preliminary Report.

The Task Force wishes to express its sincere appreciation to you for your interest and encouragement to us throughout the past year of our work. We also wish to thank the members of your staff and the Executive Departments of the State, the faculty of the University of Delaware and the many citizens and organizations who have contributed background information on which our recommendations are based.

Sincerely,



James H. Wakelin, Jr.
Chairman

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Many others have contributed in a major way in the preparation of written material which will appear in the Final Report.

FORWARD

This document is a Preliminary Report of Governor Russell W. Peterson's Task Force on Marine and Coastal Affairs and provides certain key recommendations concerning the future of Delaware's Coastal Zone. A more extensive and complete report will be issued in the next four to six months which will contain information on the present status, trends, and problem areas of the Delaware Coastal Zone together with additional recommendations not covered in this report. The more detailed report will address the major resources of Delaware including water management, fisheries and wildlife; additional aspects of recreation including parks, boating, and sportfishing; and a more extensive treatment of environmental quality including, but not limited to waste disposal, pesticides, protection of the beaches and shoreline; and the problems created by mosquitoes and other biting flies. In essence, the Final Report will be the first compilation of available information and data on Delaware's Coastal Zone.

In preparing this document, the Task Force has made use of most of the available information that will appear in the Final Report, even though that has not yet been finalized, assembled, arranged, and edited in a sufficiently well-organized form to issue at this time. In view of the urgency of certain decisions facing the State concerning the use of its Coastal Zone, the Task Force has decided to issue a Preliminary Report.

The recommendations of the Task Force are based necessarily on information found in currently available reports and through interviews, hearings, and conferences. However, many factors bearing on the use and

quality of Delaware's land and water resources in Delaware's Coastal Zone will not be well known for a number of years. Principal features and trends, however, are quite clear.

While this document, as well as the subsequent Final Report, addresses itself to assignments given the Task Force by Governor Peterson, it is a report, in a larger sense, to the members of the Legislature, and to the citizens of Delaware. The Task Force is well aware of the impact that some of its recommendations will have on the State and the well being of its citizens. In the conflicts and competition for the use of the Coastal Zone, the issues made plain to the Task Force here in Delaware are essentially the same as those now faced by the twenty-nine other Coastal Zones states of our country.

The State of Delaware is an integral part of a highly developed and still developing industrial complex. In this context, Delaware has responsibilities to fulfill as part of the Delaware Valley region. However, Delaware also has responsibilities concerning its contributions to the quality of the environment and for the conditions of living for its own citizens. Recognizing the pressures for the many diverse and often conflicting uses of Delaware's Coastal Zone, the Task Force has recommended a course of action that will enhance the quality of life and conserve and improve the natural resources of this area. This may well be the last time that such an opportunity is available to the citizens, to the Legislature, and to the Executive branch of government of Delaware.

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Map Showing Boundaries of the Coastal Zone

I. INTRODUCTION

A. Goals for a Coastal Zone Plan

Early in 1970, Governor Russell W. Peterson appointed a Task Force on Marine and Coastal Affairs "to develop a master plan for our coastal and bay areas". Since its first meeting on April 28, 1970, the Task Force has been analyzing the diverse facets of Delaware's problems in the Coastal Zone. It was early recognized that many of the factors essential to a sensible master plan were either unavailable or were incompletely understood. Accordingly, the approach the Task Force took was to define as its major objective the preparation of policy guidelines and certain key recommendations for the management and conduct of marine and coastal affairs for the State of Delaware. Such guidelines must include the wise use of the water and land resources of the State's Coastal Zone for the economic and social benefits of its citizens. This plan should guide such future actions by the State as may be required to achieve a balance among the following desirable goals:

1. Preserve and improve the quality of life and the quality of the marine and coastal environment for recreation, conservation of natural resources, wildlife areas, aesthetics, and the health and social well being of the people.
2. Promote the orderly growth of commerce, industry and employment in the Coastal Zone of Delaware compatible with goal #1.
3. Increase the opportunities and facilities in Delaware for education, training, science and research in marine and coastal affairs.

B. Definition of the Coastal Zone

THE TASK FORCE RECOMMENDS THAT, FOR GOVERNMENTAL REGULATIVE PURPOSES, THE COASTAL ZONE IN DELAWARE BE DEFINED TO INCLUDE A PRIMARY AND SECONDARY COASTAL ZONE. IT FURTHER RECOMMENDS THAT THE PRIMARY COASTAL ZONE INCLUDE THAT AREA WHICH EXTENDS SEAWARD TO THE BOUNDARY OF THE STATE'S JURISDICTION; SOUTH OF REEDY POINT ON THE C AND D CANAL THE LANDWARD EXTENT SHOULD INCLUDE THE AREA BELOW AN ELEVATION OF 10 FEET ABOVE MEAN SEA LEVEL OR ONE MILE FROM THE MEAN SEA LEVEL MARK ON THE DELAWARE RIVER AND BAY OR OCEAN SHORE WHICHEVER IS THE GREATEST DISTANCE INLAND; NORTH OF REEDY POINT THE LANDWARD EXTENT SHOULD INCLUDE THE AREA BELOW AN ELEVATION OF 10 FEET ABOVE MEAN SEA LEVEL. THE ENTIRE C AND D CANAL WITHIN DELAWARE AND THE ADJACENT SHORE FOR A DISTANCE OF ONE MILE ON EACH SIDE SHOULD ALSO BE INCLUDED WITHIN THE PRIMARY COASTAL ZONE. THE SECONDARY COASTAL ZONE SHALL BE DEFINED TO EXTEND FROM THE BOUNDARY OF THE PRIMARY COASTAL ZONE LANDWARD SO AS TO INCLUDE ALL OF THAT AREA WITHIN THE ATLANTIC COAST - DELAWARE BAY COASTAL DRAINAGE SYSTEM.

Throughout the balance of this Report, unless specific reference is made to the contrary, the term Coastal Zone will refer to the "Primary" Coastal Zone. Land use activities within this Primary Zone are described and evaluated by the Task Force in much greater detail because most of the major decisions influencing land and water use occur in this portion of the Coastal Zone. The ten feet above mean sea level contour, generally the landward extent of this zone, is also an important index to major tidal floods which are projected to this elevation at a frequency of one year in a hundred.

Important environmental changes, however, also occur in the Primary Zone due to events which originate in areas further to the interior. Accordingly, the Task Force recommends that a "Secondary" Coastal Zone be included in the definition of the total Coastal Zone. This Secondary Zone extends landward to the watershed division line for all drainage to the Delaware, Rehoboth, Indian River and Little Assawoman Bays. For the purposes of this report, the Secondary Coastal Zone is sufficient to permit evaluations of the effects of all agricultural, industrial and domestic discharges from this zone into the bays and ocean.

It is recommended that when these definitions are incorporated into a legal description, the land boundary of the Primary Coastal Zone be surveyed on the ground as a series of straight lines connecting permanent monuments which approximate the landward boundary described above.

It is recognized that the Mean Sea Level mark on the shore changes from year to year, and that for the purposes of a legal description reference be made to the date of survey and the 1929 Sea Level Datum. It is recommended that boundaries be resurveyed at approximately 50 year intervals.

The Coastal Zone of a state is generally defined to include the bays, estuaries and waters within the territorial sea or the seaward boundary, whichever is the further offshore and extending inland to the "landward extent of maritime influences".

The specific definition of a Coastal Zone has been left to each of the states to determine. On the landward side there are many accepted ways to define the zone. Some states include all of that land area which provides

natural drainage to the land-sea interface to be the landward extent of their Coastal Zone. Other states have more precisely limited the landward area to that determined by the highest high tide of record in a 100-year period or by some specified distance landward from the line of the highest normal spring tide.

In considering the definition of the Coastal Zone, the Task Force recommended that the extent of the Primary Zone approximate this once in a century highest high tide of record, and that the extent of the Secondary Zone encompass such additional landward areas which lie within the Atlantic Coast - Delaware Bay coastal drainage system.

A map has been enclosed in this report showing the approximate location of the Coastal Zone in Delaware. It should be noted that the landward boundary of the Primary Coastal Zone approximates certain highways in the State which are also shown on the map. As indicated, the Coastal Zone embraces the lands along the Atlantic Coast, Delaware River and Bay, the Little Bays, portions along the Chesapeake and Delaware Canal, the wetlands, and subaqueous lands.

C. Importance of the Coastal Zone

The Coastal Zone of Delaware is an invaluable and in many respects irreplaceable resource to the State, Region and Nation. Because of the State's size and location, there is a continuous interaction of land and sea influencing nearly all of the State. Delaware has a total saltwater shoreline of approximately 160 miles in length and a total land area of 1,983 square miles. No part of the State is more than about 8 miles from tidewater.

When considered together with the general absence of other significant topographic features and the lack of traditional mineral resources, Delaware River and Bay and other coastal bays represent not just a factor in the State's geography, but a determining factor in its history, economy and way of life.

The Delaware River and Bay is the water gateway to a great industrial and commercial complex of the Delaware Valley. The coastal bays of Delaware are part of a system of shallow water estuaries which are the nursery and rearing grounds for most fin fishes important to both commercial and sport fishermen along the East Coast of the United States. In fact, about two-thirds of the fish landed by U.S. fishermen spend part of their lives in an estuary. The tidal wetlands in Delaware, encompassing about 120,000 acres, are an important link in these grounds and provide breeding areas for birds, mammals and shellfish, produce food for all of these and are part of the aesthetic quality of the shore region.

The Atlantic Ocean, Delaware Bay and the other coastal bays and their surroundings are prime attractions for persons seeking water based recreation adjacent to the East Coast megalopolis.

Many early residences, industries and other places of historical and cultural significance are closely associated with the Coastal Zone because the tidal streams and bays provided the principal transportation routes for early settlers. To this day, the prosperity of municipalities such as Wilmington, New Castle, Delaware City, Odessa, Smyrna, Dover, Milford, Milton, Lewes, Rehoboth Beach, Bethany and Fenwick Island is closely linked to one or more coastal assets such as water transportation, water-based recreation and water based industry.

Most of the Coastal Zone contains extensive open spaces consisting essentially of salt marshes and adjoining farms and woodlands bordering the Delaware River and Bay and Rehoboth, Indian River and Assawoman Bays. The marshes not only provide habitats for fish and wildlife and provide aesthetically pleasing surroundings, as indicated above. They are also important because such areas provide resources for recreational activities which relieve man's tensions, aid in reducing air pollution, and act as buffers against flood damage.

II. ENVIRONMENTAL QUALITY

A. General

THE TASK FORCE RECOMMENDS THAT THE STATE REQUIRE AN ENVIRONMENTAL IMPACT STATEMENT WITH ASSOCIATED PUBLIC HEARINGS OF ALL MAJOR DEVELOPMENT PROJECTS WITHIN DELAWARE'S COASTAL ZONE WHICH ARE EITHER BEING PROPOSED OR ARE ALREADY UNDERWAY BUT NOT YET COMPLETED. THESE STATEMENTS SHOULD BE FURNISHED BY THOSE PROPOSING OR PERFORMING THE PROJECTS.

On January 1, 1970, a very significant Federal law was enacted, the National Environmental Policy Act of 1969 (Public Law 91-190). Section 101 (b) of the Act stated that it is the "continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

Section 102 of the Act calls for detailed statements by pertinent Federal officials concerning the environmental impact of any proposed actions which might significantly affect the environment.

On April 30, 1970 Interim Guidelines were issued by the newly created Federal Council on Environmental Quality. These guidelines were aimed at clarifying the points to be covered in the environmental statements. The first two of these points are reproduced below:

- "(i) The probable impact of the proposed action on the environment, including impact on ecological systems such as wildlife, fish and marine life. Both primary and secondary significant consequences for the environment should be included in the analysis. For example, the implications, if any, of the action for population distribution or concentration should be estimated and an assessment made of the effect of any possible change in population patterns upon the resource base, including land use, water, and public services, of the area in question.
- (ii) Any probable adverse environmental effects which cannot be avoided (such as water or air pollution, damage to life systems, urban congestion, threats to health or other

consequences adverse to the environmental goals set out in section 101 (b) of Public Law 91 - 190)."

The Task Force believes that the contents of the proposed State required environmental impact statements should be similar to the Interim Guidelines issued by the Federal Council on Environmental Quality. It is anticipated that these State required environmental impact statements will be of major value to Delaware in assessing the threats to the quality of the environment, accompanying any new commercial or recreational developments, early enough to take appropriate action.

In addition, the Task Force recommends that Delaware insist on the implementation at the National level of the procedures required by the National Environmental Policy Act of 1969 with respect to all significant activities in the interstate waterways, such as the Delaware River and Bay, the C and D Canal, and the Atlantic Ocean adjacent to Delaware.

The Task Force has considered several major issues in environmental quality. These include oil spills, industrial and municipal wastes, heavy metals in particular, thermal pollution, pesticides, and the problems associated with mosquitoes and other biting flies. Specific recommendations on these subjects will be provided in the Final Report of the Task Force.

B. Accidental Oil Spills: A Contingency Plan

THE TASK FORCE RECOMMENDS THAT THE STATE DEVELOP A CONTINGENCY PLAN FOR THE PREVENTION AND CLEANUP OF MAJOR SPILLS. THE PLAN SHOULD BE COORDINATED WITH THE COAST GUARD, THE FEDERAL ENVIRONMENTAL PROTECTION AGENCY, WITH NEW JERSEY AND PENNSYLVANIA THROUGH THE DELAWARE RIVER BASIN COMMISSION, AND WITH MARYLAND.

This plan should examine all aspects of oil spills including prevention, surveillance, and cleanup where the latter refers to source control, containment, protection of the environment during the spill, pollutant recovery, restoration of the damaged resources, and disposal of the recovered pollutants. The plan should also deal with the costs of cleanup, and a clarification of liability.

In developing the plan, the State should consider such guidelines as the following:

- The State, in conjunction with the Coast Guard, should develop monitoring and control procedures over existing lightering operations in the lower bay, and the transport of oil and other hazardous material in Delaware waters.
- A "strike force" should be established consisting of personnel who shall be trained, prepared, equipped, and available to carry out the plan.
- A substantial emergency fund should be created by the State to finance cleaning up oil spills. Procedures for the recovery of costs and damage should be established. The party responsible for the spill should be liable for all costs plus the damage caused to aquatic life and property.
- A lightering inspection fee should be imposed on transferred products to create an environmental protection fund. This fund should be used to finance protective procedures against oil spills and other toxic discharges including ballast and bilge discharges.

III. INDUSTRY AND COMMERCE

A. Deep Water Port

THE TASK FORCE RECOMMENDS AGAINST APPROVAL AT THE PRESENT TIME OF ANY DEEP WATER PORT FACILITY OR OFFSHORE ISLAND IN THE LOWER DELAWARE BAY BECAUSE:

- ANY EXPECTED ECONOMIC BENEFITS TO DELAWARE OF THE PROPOSED LOCATION IN THE BAY APPEAR TO BE MORE THAN OFFSET BY THE CONSIDERABLE ADDITIONAL RISK TO THE ENVIRONMENT.
- SUCH A FACILITY WOULD ENCOURAGE THE DEVELOPMENT OF INCOMPATIBLE HEAVY INDUSTRY AND ACCOMPANYING URBANIZATION ALONG THE SHORELINE.
- SUCH A FACILITY REQUIRES MAJOR OFFSHORE STRUCTURES, DREDGING, AND FILLING OF THE BAY WHICH CONSTITUTES A FORM OF HEAVY INDUSTRY IN ITSELF.
- SUCH A FACILITY WOULD CONTRIBUTE A MAJOR RISK OF ADDITIONAL POLLUTION IN THE BAY AND ALONG THE SHORELINE WITH ACCOMPANYING DELETERIOUS EFFECT ON ESTUARINE LIFE.

MOREOVER, THE TASK FORCE BELIEVES THAT OTHER REASONABLE ALTERNATIVES HAVE NOT YET BEEN SUFFICIENTLY INVESTIGATED. THE TASK FORCE RECOMMENDS THAT BECAUSE OF THE IMPORTANCE OF SUCH A PORT TO THE ECONOMY OF THE MID ATLANTIC REGION, THE TECHNICAL AND ECONOMIC FEASIBILITY OF AN OFFSHORE FACILITY ON THE CONTINENTAL SHELF SHOULD BE EXPLORED ON A REGIONAL BASIS WITH THE FEDERAL GOVERNMENT. THE CONCEPT OF A FACILITY FOR DEEP DRAFT VESSELS, PERHAPS 25-50 MILES OFFSHORE, HAS BEEN SUBMITTED TO THE TASK FORCE. SUCH A FACILITY FOR THE TRANSFER OF OIL AND BULK CARGOES WOULD ACCOMMODATE VESSELS ABOVE 250,000 TONS, WELL BEYOND THE PRESENT LIMITS OF CAPABILITY OF ANY DEEP WATER PORT WITHIN THE DELAWARE BAY.

One of the major national issues in this country concerns the need for a deep water port to serve the East Coast of the United States. Federal agencies are now conducting studies concerning its economic and engineering feasibility. Major industries, such as petroleum, coal, and iron ore, have been examining the Lower Delaware Bay as a prime location on the East Coast for providing a naturally deep and sheltered harbor. This is also considered a desirable location due to its proximity to raw materials and markets.

The Delaware River and Bay is the largest import region in the United States. It contains, north of the Chesapeake and Delaware Canal, the largest concentration of oil refineries on the East Coast, and it is the second largest port area (taken as a region) in tonnage of commerce.

The supply of crude oil to the present seven refineries of the Delaware estuary has grown to almost 1,000,000 barrels a day. However, the continuation of growth essential to the economy will result in increased reliance on lightering operations which will be increasingly difficult to monitor and control under present procedures, thereby raising pollution risks substantially. Those supporting a deep water facility for off loading to a pipeline state that such a facility could conceivably reduce this risk and thereby enable a substantial growth in tonnage transported.

Advocates of a Lower Bay deep water port location also point out that it is impossible, ecologically and economically, to dredge a sufficiently deep channel (i.e. in the order of 80 feet) from the Lower Bay to Philadelphia to handle the anticipated large ships of the late 1970's and 1980's. They also emphasize that an offshore deep water facility for the off loading of oil in

the Lower Bay would reduce the traffic to the Philadelphia area. In addition, it would minimize the need to conduct lightering operations in the Bay. These advantages would, according to the advocates, improve the situation that already exists, and could reduce chances for an accidental spill of oil or other hazardous substances.

Two public meetings conducted by the Army Corps of Engineers in early 1970, however, produced strong protests from the public who warned of the potential for ecological disaster from accidental oil spills and of the inevitable development of incompatible heavy industry and its effect on the way of life in the region. While possible economic advantages of such a terminal were acknowledged, opponents pointed out that one major spill from a supertanker inside the Bay could be catastrophic to tidal marshes and coastal resorts in southern Delaware and New Jersey. Moreover, the additional dredging required to construct a port of this magnitude and to provide and maintain a channel with a depth of eighty feet or more extending to the mouth of the Bay could result in incalculable environmental harm.

Opponents of the deep water port in Delaware Bay have suggested that industry consider locating an offshore terminal on the Continental Shelf, at a distance of 25-50 miles from the mainland. If this concept were proven feasible, several such terminals could be located along the East Coast, with a consequent reduction of the concentration of shipping at one point and a corresponding risk of environmental damage to that portion of the coastline nearest to the terminal. Single buoy mooring systems for off-loading oil from tankers to pipelines which transfer the oil to the coastline have been

installed in over 50 locations around the world. Other concepts, such as floating terminals, have been suggested and should be considered in any feasibility study of Continental shelf bulk transfer terminals.

B. Introduction of New Industry into Delaware's Coastal Zone

THE TASK FORCE RECOMMENDS THE ENCOURAGEMENT OF NEW INDUSTRIES WHICH ARE COMPATIBLE WITH HIGH ENVIRONMENTAL STANDARDS AND WHICH WOULD EMPLOY A RELATIVELY HIGH RATIO OF EMPLOYEES IN RELATION TO THE SPACE OCCUPIED AND PUBLIC SERVICES REQUIRED.

THE TASK FORCE ALSO RECOMMENDS THAT THERE BE NO FURTHER INTRUSION OF INCOMPATIBLE HEAVY INDUSTRY INTO THE COASTAL ZONE SINCE POLLUTION AND OTHER ADVERSE ENVIRONMENTAL AND SOCIAL EFFECTS, NORMALLY ATTENDANT UPON SUCH DEVELOPMENTS, PRESENT SERIOUS THREATS TO THE COASTAL ENVIRONMENT, THE NATURAL RESOURCES OF THE BAYS, AND THE QUALITY OF LIFE IN DELAWARE.

The Task Force specifically includes as incompatible heavy industries such installations as steel mills, paper mills and oil refineries, and any other industry that traditionally introduces unacceptable quantities and types of pollutants into the air, land or water and, by its very size and nature, causes massive adverse environmental changes over a wide area.

IV. RECREATION

A. General

Outdoor recreation is recognized as an already existing major desirable activity in Delaware because of its favorable impact on the quality of life and the economy of its citizens. It is also recognized that the success of this activity is strongly contingent upon the maintenance of a satisfactory level of environmental quality.

IN VIEW OF THE CLOSE RELATIONSHIP BETWEEN RECREATION AND THE ENVIRONMENT AND BECAUSE OF THE IMPORTANCE OF RECREATION TO THE WELL-BEING OF THE PEOPLE OF DELAWARE, THE TASK FORCE RECOMMENDS THAT THE STATE DO THE FOLLOWING:

- MAKE A FULL ASSESSMENT OF THE TOTAL OUTDOOR RECREATIONAL ACTIVITIES IN THE STATE'S COASTAL ZONE, INCLUDING SWIMMING, BOATING, SPORT FISHING, TOURISM, CAMPING, AND SIGHTSEEING.
- INSURE THAT SUFFICIENT RECOGNITION IS ACCORDED TO THE NEED FOR, AND ACCESS TO, ADEQUATE RECREATIONAL FACILITIES.
- INSURE THAT CAREFUL CONSIDERATION OF THE COASTAL ZONE ENVIRONMENT BE MADE AN INTEGRAL PART IN THE PLANNING FOR SUCH ACTIVITIES AS HOUSING, INDUSTRY, TRANSPORTATION, AND WATER MANAGEMENT INCLUDING IMPOUNDING, DRAINING, DREDGING AND MOSQUITO CONTROL.
- ENCOURAGE THE PARTICIPATION OF PRIVATE ENTERPRISE IN EXPANDING THE STATE'S RECREATIONAL ACTIVITIES.

Certain aspects of recreation, such as sportfishing, were evaluated in 1956 and 1968. A major step in the appraisal of Delaware's recreation potential was the issuance of the October 1970 Comprehensive Outdoor Recreation Report. However, these studies require further extension in a number of ways particularly in terms of economic analysis. An adequate

measurement of the total recreation potential is essential for managing the Coastal Zone to the optimum extent. Knowledge of the economic aspects of outdoor recreation is essential in weighing priorities for land and water uses in future planning and regulatory decisions. However, since the degree of satisfaction of recreation to the user is frequently beyond economic measure, decisions involving such factors as the physical and mental health and well-being of the user must also rely heavily on value judgments. Knowledge of the physical facility limitations on outdoor recreation is also essential in determining the carrying capacity for recreational use of the coastal zone.

B. Resorts - Tourism

THE TASK FORCE RECOMMENDS THAT THE STATE HELP LOCAL COMMUNITIES TO DEVELOP ADDITIONAL RECREATIONAL AREAS AND TO PROVIDE ADEQUATE PUBLIC FACILITIES FOR TOURIST SERVICES.

The carrying capacity of Delaware's tourist attraction areas should be determined by detailed studies and planning to consider such factors as amount of usable water front, parking facilities, sewage, water supply, transportation, and other public facilities and their relationship to quality recreation.

Tourism should be encouraged in areas of high carrying capacity. The carrying capacity will vary with the state of development. Certain areas encompassing the Delaware Bay, Atlantic Coast, Small Bays, and several State recreational facilities currently have a level of usage which exceeds the capacity of existing facilities. Temporarily, these locations should not be

heavily promoted, but rather, the State's efforts should be concentrated on expansion of the services and facilities necessary to permit the optimum use of these areas. Efforts should also be directed toward expanding the tourist season, especially where carrying capacity is exceeded during the prime season.

V. COASTAL ZONE REGULATION AND ACQUISITION

A. Coastal Zone Legislation

THE TASK FORCE RECOMMENDS THAT, BEFORE THE MORATORIUM ON COASTAL ZONE DEVELOPMENTS IS ALLOWED TO EXPIRE, LEGISLATION FOR ADEQUATE LAND AND WATER USE CONTROLS SHOULD BE ENACTED FOR THE ENTIRE DELAWARE COASTAL ZONE.

Adequate land and water use controls should include zoning, a system of permits, strengthened subaqueous land laws, cease and desist authority, and required environmental impact statements on all major public and private construction projects.

The legislation should enunciate a strong commitment of legislative intent which reflects awareness of Coastal Zone problems and values, states a general policy of estuarine management, and a specific policy of wetlands preservation.

The planned Open Space concept for the Coastal Zone from Reedy Point to Cape Henlopen and a portion of the lands surrounding Rehoboth, Indian River and Little Assawoman Bays was advanced in the Delaware Comprehensive Outdoor Recreation Plan (October 1970). This concept proposed to conserve these areas for quality outdoor recreation in such a way as to make them highly attractive to a variety of pursuits including swimming, boating, fishing, picnicking, hunting, and sightseeing; and to preserve the role of the wetlands as a suitable habitat for wildlife and as a source of nutrients and nursery grounds for oysters and other commercial fisheries. Since these activities have not been compatible with most kinds of heavy

industry or with over-commercialization of recreational pursuits, land-use controls will be necessary to encourage high quality recreation and fisheries and to discourage the industries and commerce that adversely affect the environment.

Legislation will be necessary as indicated by the following:

1. Land and Water Use Controls Throughout the Primary Coastal Zone.

- Establish the right of the State, in consultation with the Federal Government, neighboring states, and local governments, to plan for and to determine overall development patterns, through State zoning, within the seaward (subaqueous) portion of the Primary Coastal Zone, such as the Delaware and Little Bays and Atlantic Ocean.
- Establish the right of the State, in consultation with the counties and municipalities, to set enforceable minimum standards for land use controls within the landward portion of the Primary Coastal Zone. Such action would not do away with county and municipal planning and zoning within this area. Rather, the standards would be used as a framework for county and municipal planning and zoning. The advantage of enacting this legislation is that it would permit the local governments to retain some flexibility in determining future uses in their areas, and it would give the State the power of review and approval in case of conflict between local practice and State land and water use policy.

These recommended land and water use responsibilities of the State, in the Primary Coastal Zone, should be considered as the major key to the implementation of the State's planned Open Space concept and should be strengthened as quickly as possible by wetland protection legislation and State acquisition of key areas.

2. Wetlands portion of the Primary Coastal Zone. Provide for the preservation of wetlands and establish controls over those types of alterations which would cause environmental degradation.

B. Acquisition

THE TASK FORCE RECOMMENDS THAT THE STATE FUNDING SCHEDULE PROJECTED BY THE 1970 DELAWARE COMPREHENSIVE OUTDOOR RECREATION PLAN FOR THE ACQUISITION OF PUBLIC LANDS IN THE COASTAL ZONE BE SUBSTANTIALLY ACCELERATED.

The State should stand ready to protect the character, natural potential and features of open spaces within the Coastal Zone. In order to supplement the zoning or permit tools, sufficient funds should be made available for acquisition in certain key areas to prevent environmental damage, to maintain the desired development pattern, and to protect the options for Coastal Zone use for future generations.

The Task Force also recommends the acquisition of certain key areas where it has been found essential for efficient public management and for adequate public access. The Delaware Comprehensive Outdoor Recreation Plan (page 143) has identified such areas for public acquisition.

The pressures for land development in the Delaware Coastal Zone are evident. It must also be noted that the opportunity to preserve open spaces is rapidly being lost by continued developments, by constantly rising real estate prices, and by continued commitment to long range planning and study by industrial and commercial interests and developers. The State should act quickly to acquire areas deemed essential.

Work undertaken as part of the October 1970 Delaware Comprehensive Outdoor Recreation Plan determined that public land purchases of about \$10 million will be necessary during the two year period FY 1971 and FY 1972. The Recreation Plan also recommended that an additional \$12 million be spent in the FY 1973-76 period (See pages 201-206 of the Plan).

The Task Force believes, however, that considerable savings will result to the State by a larger initial appropriation for land purchases to forestall further escalation of land prices which are inherent in protracted land acquisition programs.

It is important to note that this recommended level of funding for land acquisition is based on the assumption that the State will have adequate land and water use controls as recommended in this Report.

VI. RESEARCH AND EDUCATION

A. State Supported Research Program

THE TASK FORCE RECOMMENDS A SUBSTANTIAL INCREASE IN FUNDING FOR A COASTAL ZONE RESEARCH PROGRAM TO FURNISH THE SCIENTIFIC AND TECHNICAL INFORMATION ON WHICH THE STATE WILL MAKE ITS COASTAL ZONE MANAGEMENT DECISIONS. THE STATE, IN CONSULTATION WITH THE COASTAL ZONE ADVISORY COUNCIL (See Page 7-4) AND THE COLLEGE OF MARINE STUDIES, SHOULD DETERMINE THE PRIORITIES AND RECOMMEND THE FUNDING LEVEL OF COASTAL ZONE RESEARCH NEEDED FOR EFFECTIVE COASTAL ZONE MANAGEMENT IN DELAWARE. IT IS FURTHER RECOMMENDED THAT THE COLLEGE OF MARINE STUDIES OF THE UNIVERSITY OF DELAWARE BE ASSIGNED A MAJOR ROLE IN THE CONDUCT OF THIS RESEARCH PROGRAM AND THAT IT CREATE A COASTAL ZONE TECHNICAL SERVICES DIVISION WITH BASE FUNDING FROM THE STATE TO MEET THESE NEEDS.

The Coastal Zone Research Program should include economic, social, and legal aspects, in addition to natural and physical sciences and engineering. The State should make maximum use of the existing capabilities of Delaware industry and recognize the special competence of academic institutions in the State. The State should work closely with neighboring States on problems overlapping their jurisdiction, such as the proposed baseline study of the Delaware estuary. The State

should also have an in-house research management capability to facilitate the solution of short term problems; to enhance the State's monitoring and analysis functions concerning the conditions of Delaware's marine resources for more effective regulation, enforcement, and management; and for administrative fact-finding. It is anticipated that the skilled technical services needed to accomplish these purposes can frequently be accompanied by contracting with industry and academic institutions, under the direction of the State's research management.

The State should recognize the recent efforts of the University of Delaware in expanding its capabilities in marine and coastal research. In recognition of this increasing capability, the State, in the conduct of its Coastal Zone Research Programs, should maintain close professional association with the University's College of Marine Studies. Moreover, the University should be sufficiently equipped with the necessary facilities and assured of adequate institutional funding for continuity and maintenance of both programs and facilities. The funding should be allocated for education as well as the research appropriate to the University's function. It is further expected that the College of Marine Studies will be called upon by the State for special projects, such as research elements of the Delaware Baseline Study. The creation of a Coastal Zone Technical Services Division by the College of Marine Studies will facilitate services to the State over and above those already provided by the University in its Coastal Zone student training program.

B. Marine Science Center

THE TASK FORCE AGREES THAT A MARINE SCIENCE CENTER SHOULD BE ESTABLISHED UNDER THE MANAGEMENT DIRECTION OF THE COLLEGE OF MARINE STUDIES OF THE UNIVERSITY OF DELAWARE. THE MARINE SCIENCE CENTER WOULD INCLUDE FACILITIES FOR THE COLLEGE OF MARINE STUDIES, A COASTAL ZONE RESEARCH LABORATORY, ADJACENT SPACE FOR RESEARCH ORIENTED MARINE INDUSTRIES, A PUBLIC INFORMATION CENTER, AND A SCIENTIFIC INFORMATION CENTER FOR DELAWARE BAY AND THE MID-ATLANTIC REGION.

The State of Delaware has long been dependent on many facets of the marine environment for its well being. Historically, it has had a significant role in shipbuilding, marine transportation, fisheries and, more recently, an extensive marine oriented recreational industry. In addition, the value of marine research was recognized officially by the State in the early 1950's when it established the Marine Laboratory of the University of Delaware and stated that one of its functions should be to furnish scientific and technical assistance to the State Executive Branch. Since that time an increasing emphasis has been placed on marine science by the University of Delaware. In the summer of 1970, the Board of Trustees approved the establishment of a College of Marine Studies. This unit has the potential to encourage the growth of a marine research and educational organization which could achieve a position of national and international stature by the end of the present decade. Of particular value to the State of Delaware is the

scientific strength of the College of Marine Studies and its concern for the problems of the State of Delaware and the mid-Atlantic region. Research at the University, sponsored through the Federal Sea Grant Program, is building a strong scientific base for the study of estuarine and coastal processes appropriate for the function of a Coastal Zone Research Laboratory and its attendant advisory role to the State. The establishment of a Marine Science Center would do much to assure the growth of this capability.

Components of the proposed Marine Science Center are described in greater detail in the Final Report to be submitted in four to six months.

C. Baseline Study

THE TASK FORCE RECOMMENDS THAT A COMPREHENSIVE BASELINE STUDY OF THE PRINCIPAL WATER BODIES OF DELAWARE'S COASTAL ZONE BE PERFORMED WITH THE UNIVERSITY OF DELAWARE HAVING THE MAJOR ROLE IN THE PLANNING OF THE STUDY AND THE SUBSEQUENT SCIENTIFIC RESEARCH. MOREOVER, THE BASELINE STUDY SHOULD BE PERFORMED IN COOPERATION WITH NEW JERSEY, MARYLAND, THE DELAWARE RIVER BASIN COMMISSION, AND THE FEDERAL GOVERNMENT.

IN CONJUNCTION WITH THE STUDY, A CONTINUOUS MONITORING SHOULD BE INITIATED AND MAINTAINED BY THE STATE OF SELECTED PHYSICAL PARAMETERS AND BIOLOGICAL PHENOMENA WHICH ARE PERTINENT TO THE STATE'S REGULATORY FUNCTIONS.

This program should include studies in biology, chemistry, physical oceanography, climatology, hydrology and geology. The program should be supported by appropriate studies in the surrounding tidal marshes and streams, the Atlantic Shelf Area, the Chesapeake and Delaware Canal, and the Delaware River. This study is expected to involve about five years of scientific work, with preliminary results published on the basis of the first one and two years of work. It should include among its objectives the description of the Bay's physical and biological resources, and the establishment of practical predictive models.

There is a need for information on the natural state of the Delaware Bay and its surroundings to form the basis for rational decisions on utilization. This need is recognized by most of those concerned with the conservation, regulation, or development of Delaware's Coastal Zone. It is made more acute by present and proposed projects destined to affect the system. Among these are: an ensemble of off-shore developments associated with deep-draft vessels, the Tocks Island Reservoir, the enlargement of the Chesapeake and Delaware Canal, the installation of waste treatment plants at Philadelphia and in Kent and lower Sussex Counties, and the Salem Nuclear Generating Station.

All of these projects have supporting engineering studies associated with them and some have ecological surveys as well. The difficulty is that these studies have restricted themselves in the

past to the immediate vicinity of a project and have not related to the Bay as an interdependent system. In addition, a comprehensive, integrated study of the Bay has been too costly and time consuming to charge to any one project - especially when many separately funded projects would utilize the information; nevertheless, there is a necessity to establish a scientific baseline defining the present condition of the Bay and River as an interrelated system. The study establishing this baseline should be of such a nature as to shed substantial light on the dynamics of the system and to form the basis for practical predictive models of the Delaware River-Bay complex.

The Baseline Study will provide the basis for a systematic review of all projects involving the principal water bodies of Delaware's Coastal Zone. It will not relieve individual development projects of the need for intensive local studies but will provide a context in which these local evaluations can be seen in relation to the Coastal Zone as a whole.

VII. COASTAL ZONE MANAGEMENT STRUCTURE

A. Need for a Coastal Zone Management Structure

THE TASK FORCE RECOMMENDS THAT A FOCAL POINT FOR COASTAL ZONE MANAGEMENT BE ESTABLISHED IN THE EXECUTIVE BRANCH OF THE STATE GOVERNMENT.

This report has delineated the significance of the Coastal Zone to the people of Delaware. It has also discussed its special vulnerability to rapid degradation unless proper steps are taken. Many of these steps were outlined in previous chapters of this report and include the need to recognize its importance, to define its extent for administrative purposes, to enact suitable legislation, to regulate its use for the optimum benefit of the public, and to acquire areas of special importance.

In addition, there is an urgent need to improve the present structure in the State Government for the management of Delaware's Coastal Zone.

The Federal Government, spurred by the recent Stratton Commission Report, has been increasingly recognizing the importance of the Coastal Zone and the major role which the States should play as a link between the Federal Government and the counties and municipalities. Other States are moving in the direction of strengthened State Coastal Zone management.

While Delaware is a small State, it lies along one of the most important estuaries on the East Coast for industry and contains one of

the most attractive shorelines along the Atlantic Ocean for recreation. These recreational areas are conveniently accessible to the millions of people living in the Eastern Megalopolis. Rapidly building competing pressures for the use of this Coastal Zone strongly suggest that the State must strengthen its organizational capability to resolve multiple user conflicts and to protect and enhance the value of the State's Coastal Zone.

B. Responsibilities of NREC

IN VIEW OF NREC'S EXISTING RESPONSIBILITIES IN THE MANAGEMENT OF NATURAL RESOURCES AND THE PROTECTION OF THE ENVIRONMENT, THE TASK FORCE RECOMMENDS THAT NREC BE DESIGNATED AS THE PRINCIPAL STATE AGENCY RESPONSIBLE FOR COASTAL ZONE MANAGEMENT.

It is recommended that the Coastal Zone management responsibilities of the NREC be as follows:

- Provide for the formulation and periodic updating of a master plan for the utilization of coastal and estuarine waters and lands.
- Encourage the planned development of these areas in the public interest and in accordance with the master plan. This includes the authority to provide either directly, or to encourage through another government agency or the private sector, the development of such public facilities as beaches, marinas and other recreational or waterfront developments; and to lease off-shore areas.

- Resolve Coastal Zone multiple use conflicts through such public processes as regulations, permits, zoning, and land acquisition.
- Insure the necessary expansion of research capability to adequately manage the Coastal Zone. This capability should make maximum use of existing competence in the academic, private, and governmental sectors available for this purpose.
- Represent and reconcile the interests of Delaware with other states, existing interstate organizations, and the Federal Government in the development of a master plan for Delaware's Coastal Zone and in other matters relating to the management of the Coastal Zone.

C. State Management of Transportation in the Delaware River and Bay

THE TASK FORCE RECOMMENDS THAT CONSIDERATION BE GIVEN TO RECONSTITUTING THE WILMINGTON MARINE TERMINAL UNDER STATE MANAGEMENT WITH RESPONSIBILITY AND AUTHORITY FOR ALL PORT FACILITIES IN THE STATE, INCLUDING THE LOWER BAY. THIS RECOMMENDATION IS PROPOSED BECAUSE IT IS THE SENSE OF THE TASK FORCE THAT THE ENTIRE LOWER DELAWARE BAY IS ITSELF A MAJOR PORT IN TERMS OF TRAFFIC, TRANS-SHIPMENT AND LIGHTERING OPERATIONS WITHIN DELAWARE STATE BOUNDARIES.

A revision of the charter of the Wilmington Marine Terminal would allow the revised organization to institute controls and monitoring operations on the current activity in the Delaware portion of the lower and upper part of the Bay as well as any future established activity within State jurisdiction.

D. Coastal Zone Interagency Coordinating Mechanism

IN VIEW OF SEVERAL STATE AGENCIES ALREADY INVOLVED IN COASTAL ZONE ACTIVITIES AND THE NEED TO COORDINATE THE ACTIVITIES OF THESE AGENCIES, THE TASK FORCE RECOMMENDS THAT THE GOVERNOR ESTABLISH AN INTERAGENCY COORDINATING MECHANISM FOR STATE COASTAL ZONE ACTIVITIES AND THAT HE BE RESPONSIBLE FOR DESIGNATING ITS CHAIRMAN.

E. Coastal Zone Advisory Council

THE TASK FORCE RECOMMENDS THAT THE GOVERNOR ESTABLISH A COASTAL ZONE ADVISORY COUNCIL TO ADVISE THE GOVERNOR AND ALL PERTINENT STATE ORGANIZATIONS. THIS COUNCIL SHOULD PROVIDE GUIDELINES FOR THE MANAGEMENT OF THE COASTAL ZONE ON SUCH SUBJECTS AS SCIENCE, TECHNOLOGY, LAW, ECONOMICS, ENVIRONMENTAL QUALITY, RECREATION, COMMERCIAL FISHERIES, WATER SUPPLY AND QUALITY, AND MARINE TRANSPORTATION. IT SHOULD PROVIDE A CONTINUOUS MEANS FOR FURNISHING GUIDANCE FROM THE ACADEMIC, COMMERCIAL AND INDUSTRIAL SECTORS, FROM THE COUNTIES AND MUNICIPALITIES, FROM PRIVATE AGENCIES, AND THE PUBLIC.

- THE TASK FORCE RECOMMENDS THAT THE PRESENT GOVERNOR'S COUNCIL ON SCIENCE AND TECHNOLOGY COMPRIZE THE NUCLEUS OF THE PROPOSED COASTAL ZONE ADVISORY COUNCIL IN ORDER TO MINIMIZE THE EXISTING NUMBER OF ADVISORY COUNCILS AND DUPLICATION OF EFFORT. THE TASK FORCE FURTHER RECOMMENDS THAT THE MISSION OF THE PRESENT GOVERNOR'S COUNCIL ON SCIENCE AND TECHNOLOGY BE REVISED TO INCLUDE THE COASTAL ZONE OBJECTIVES CITED ABOVE, THAT THE MEMBERSHIP OF THE PRESENT COUNCIL BE BROADENED TO MEET THESE NEW RESPONSIBILITIES, AND THAT THE NAME BE CHANGED TO REFLECT THIS EXPANDED SCOPE.

1. Function of the Advisory Council

The functions of the Coastal Zone Advisory Council would include the following:

- Review and advise on updating the long range (i.e. in the order of 10 years or more) objectives of Coastal Zone programs.
- Assess current levels of activity in terms of accomplishing the long range objectives.
- Offer guidance and recommend important new Coastal Zone programs and facilities, making effective use of the competence of both private and government organizations.

2. Membership of the Advisory Council

It is recommended that this Advisory Council consist of official members representing private enterprise, the counties and municipalities, the academic community, private agencies, and the public. The chairman should be selected from outside the Government. In addition to the official members, representatives of the State and Federal Government should be designated liaison members. This would assure that the committee was aware of the programs and problems of the Government agencies. All members should be appointed by the Governor and should serve staggered terms. This committee should be supported by an appropriate staff.

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